Financial consequences for Danish fishermen following the agreed 2017 reduction in the cod quota for the western Baltic Sea

supplement note to IFRO Commissioned Work 2016/16

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Contents

Introduction

The European Union agreed on the 10th October 2016 about the TAC for cod (*Gadus morhua*) in subdivisions 22–24 in the western Baltic Sea for 2017. The TAC was set to 5,597 tonnes, which will the result in a Danish cod quota of 2,444 tonnes in 2017. This is a reduction compared to previous years, where the quotas were 7,639 tonnes in 2015 and 6,248 tonnes in 2016, respectively. This is a lower reduction compared to the ICES Advice (version 2) on fishing opportunities, catch, and effort covering cod, western Baltic stock (western Baltic Sea) published 3rd June 2016, where the TAC in 2017 was proposed to be no more than 917 tonnes. Including eastern Baltic cod fished in subdivision 24 in the TAC for subdivisions 22-24 according to the ICES advice, the total TAC for subdivisions 22-24 could be 1,588 tonnes, resulting in a Danish quota of 686 tonnes.

Based on the above, the Danish Agrifish Agency has requested a comparison of the financial consequences of the agreed quota compared to the initial ICES advice.

The requested analysis will be undertaken in this note using the same data and approach as used in Andersen, J. L., Frost, H. S., & Andersen, P., (2016). Financial consequences for Danish fishermen following a reduction in the cod quota for the western Baltic Sea, (IFRO Commissioned Work; No. 2016/16). Given that this note is a supplementary note to IFRO Commissioned Work; No. 2016/16, a major part of the text will be similar to the text in that note. No alterations are made besides changed numbers, as the same trends are observed at a reduced scale.

The Department of Food and Resource Economics, University of Copenhagen has addressed these questions through the research-based consultancy contract that the Department has with the Ministry of Environment and Food.

1. Financial consequences for the fishermen

In order to assess the financial repercussions of the reduced cod quota in the western Baltic Sea, a calculation is carried out with landings data from 2015 and estimated cost data for 2015 (based on 2012-2014 cost data). The calculation is static-comparative, and addresses the question, what could have happened in 2015, if the cod quota had been 2,444 tonnes and not 7,639 tonnes. The data sources are the Vessel Register and Sales Notes Register hosted by the Danish AgriFish Agency and the Cost and Earnings Database hosted by Statistics Denmark. Calculations of the long term effects following any changes in stock and fleet size are not considered.

Cost information is only available for the commercial vessels, thus the financial performance indicators are only calculated for the commercial vessels, while landings weight and value is calculated for all the vessels that in 2015 caught cod in the western Baltic Sea.

Having 2015 as the baseline, the financial consequences will be addressed based on two scenarios indicating the expected minimum and maximum repercussions on the profitability of the vessels. Depending on the fishermen's possibilities to change their behaviour, this could to some extend reduce the effects. However, depending on the type of changed behaviour, this could result in reduced fishery options for other fishermen, who are not fishing in the Baltic Sea. It is doubtful

whether this could happen without interference in the current management of the fishery with individual transferable quotas.

In the minimum repercussion scenario, it is assumed that the reduced cod quota in the western Baltic Sea will only result in reduced landings of cod, but assuming that the cod quota is utilised 100% in 2015 instead of 94%, which was the actual quota utilisation in 2015. In this scenario, it is assumed that catches of cod can be avoided, which will require change in fishing patterns. There are some differences in fishing seasons for the various species, with the season for cod peaking in winter and spring, but by-catches of cod cannot be complete avoided in the seasons for other fish than cod. It is therefore assumed that part of the cod quota is reserved for by-catches in other fisheries and seasons. Otherwise a conflict with the landing obligation may arise in this scenario.

In the maximum repercussions scenario, it is assumed that not only the landings of cod are reduced, but also the landings of other consumption species are reduced as well, except species caught with no or little bycatch of cod, i.e. herring, sprat, sand eel, salmon and eel. The applied reduction is calculated as the proportion between a landing of 2,444 tonnes cod (assuming 100% utilisation) and the actual landings of cod in 2015.

From Table 1, it is seen that in the baseline (i.e. 2015) the total landings value was 344 mill DKK from all areas 22-24 by the 392 vessels catching cod in the western Baltic Sea. If it is assumed that the agreed lower cod quota only has an impact on the catches of cod, the total landings value will be reduced with 56 mill DKK equal to a reduction of 16%. The reduction will increase to 76 mill DKK, (22)%, if the landings of other species are reduced as well. The impact on the small vessels is significant with a reduction in landings value up to 50%. The large vessels fishing in other areas as well are less impacted with reductions around 15%. The calculations do not take into account a change in fishing pattern towards species with higher quotas, mainly plaice. Even if such a change in fishing pattern is possible (depends amongst other things on whether cod is a choke species in the plaice fishery), it may imply extra costs (switching costs) making it uncertain whether it will result in a net economic profit. Furthermore, if such positive net economic profit exists, it will require that the vessels having cod quota also have plaice quota in order to fish for plaice.

Table 1 Total landings value for the vessels catching cod in the western Baltic Sea (1,000 DKK)

	Length	Primary gear	Baseline	ICES TAC proposal (686 tonnes)		Agreed TAC (2,444 tonnes)	
				Only lower cod landings	Reduced landings of cod and other species	Only lower cod landings	Reduced landings of cod and other species
Commercial	<12m	Gillnet/hook	27,669	15,083	8,609	18,491	13,770
		Dory/trap	7,646	6,819	5,579	7,043	6,138
		Seine/gillnet/trawl	12,188	8,467	6,788	9,475	8,250
		Trawl	8,595	6,319	4,978	6,936	5,957
		Total	56,098	36,688	25,954	41,944	34,117
	12-15m	Gillnet/hook	2,630	998	273	1,440	911
		Seine/gillnet/trawl	8,458	6,721	5,945	7,191	6,625
		Trawl	30,854	20,715	18,958	23,461	22,180
		Total	41,941	28,434	25,175	32,092	29,716
	15-18m	Gillnet/hook	4,289	2,205	1,585	2,769	2,317
		Seine/gillnet/trawl	18,965	14,117	13,020	15,430	14,630
		Seine	4,695	3,975	3,953	4,170	4,154
		Trawl	62,946	53,153	49,868	55,805	53,409
		Total	90,895	73,449	68,426	78,173	74,511
	18-24m	Seine	26,070	20,955	20,855	22,340	22,267
		Trawl	61,770	54,590	53,562	56,534	55,785
		Total	87,840	75,544	74,418	78,874	78,053
	24-40m	Trawl mixed	20,250	16,869	16,165	17,785	17,272
		Trawl consumption	27,118	22,844	22,317	24,002	23,617
		Total	47,368	39,714	38,482	41,787	40,889
	Total		324,142	253,829	232,455	272,870	257,284
Less active-commercial	<12m	Gillnet/hook	10,280	5,974	2,638	7,140	4,707
		Dory/trap	5,410	4,762	3,378	4,938	3,928
		Seine/gillnet/trawl	3,821	2,710	1,004	3,011	1,767
		Trawl	88	72	8	76	30
		Total	19,598	13,518	7,027	15,164	10,431
	12-15m	Seine/gillnet/trawl	237	212	203	218	212
		Trawl	48	11	5	21	16
		Total	285	223	208	240	229
	Total		19,884	13,741	7,235	15,404	10,660
Total			344,026	267,570	239,690	288,274	267,944

Source: Own calculations based on data the Danish Agrifish Agency and Statistics Denmark

In order to calculate the financial repercussions for the vessels involved, this can only be done for the commercial vessels[1]. Following the reduction in landings will entail a reduction in days at sea and, consequently, have an impact on some of the operating costs undertaken, i.e. lower activity gives rise to lower cost. These costs are fuel costs, provision and ice costs, sales costs and crew payments. The remaining costs, i.e. insurance costs, maintenance costs, various other costs and capital costs are considered to be independent of the activity level.

Two financial performance indicators are calculated in form of 1) gross profit: earnings defined as landings value minus operating costs, and thus portrays the surplus available for payment of crew and capital, and 2) net profit: defined as earnings minus crew payments, and thus portrays what is left to pay off the invested capital. The gross profit is regarded the best indicator of the financial development of small vessels of less than 12 metres and some of the vessels 12-15 meters. This is because hired crew is small for these vessels, and hence the proportion of crew payments can be overestimated.

The gross profit and net profit per vessel in the two scenarios are presented in Table 2 and Table 3. Both indicators show that the financial performance of these vessels will deteriorate significantly, even if only the cod landings are reduced.

Table 2 Gross profit per vessel (1,000DKK)

			ICES TAC proposal (686 tonnes)		Agreed TAC (2,444 tonnes)	
Length	Primary gear	Baseline	Only lower cod landings	Reduced landings of cod and other species	Only lower cod landings	Reduced landings of cod and other species
<12m	Gillnet/hook	326	76	-53	143	50
	Dory/trap	362	297	200	315	244
	Seine/gillnet/trawl	285	130	61	172	121
12-15m	Gillnet/hook	793	125	-172	306	89
	Seine/gillnet/trawl	529	354	276	402	345
	Trawl	915	456	376	580	522
15-18m	Gillnet/hook	2,550	852	348	1,312	944
	Seine/gillnet/trawl	1,180	736	635	856	783
	Seine	817	636	631	685	681
	Trawl	1,697	1,325	1,200	1,426	1,335
18-24m	Seine	2,206	1,642	1,631	1,795	1,787
	Trawl	4,258	3,623	3,532	3,795	3,729
24-40m	Trawl mixed	12,508	9,853	9,285	10,592	10,178
	Trawl consumption	8,690	7,032	6,827	7,480	7,331

Source: Own calculations based on data the Danish Agrifish Agency and Statistics Denmark

[1] Except for trawlers below 12 meters for which there are not sufficient statistical material to undertake the analysis.

Table 3 Net profit per vessel (1,000 DKK)

Length	Primary gear	Baseline	ICES TAC proposal (686 tonnes)		Agreed TAC (2,444 tonnes)	
			Only lower cod landings	Reduced landings of cod and other species	Only lower cod landings	Reduced landings of cod and other species
<12m	Gillnet/hook	-66	-138	-175	-119	-146
	Dory/trap	-191	-193	-201	-192	-198
	Seine/gillnet/trawl	-26	-85	-112	-69	-89
12-15m	Gillnet/hook	215	-95	-232	-11	-111
	Seine/gillnet/trawl	98	11	-28	35	6
	Trawl	194	-29	-68	31	3
15-18m	Gillnet/hook	708	-92	-331	126	-48
	Seine/gillnet/trawl	314	91	41	152	115
	Seine	278	182	179	209	206
	Trawl	610	409	341	464	415
18-24m	Seine	741	467	462	542	538
	Trawl	1,959	1,596	1,543	1,696	1,657
24-40m	Trawl mixed	7,055	5,118	4,747	5,600	5,330
	Trawl consumption	4,944	3,872	3,740	4,161	4,065

Source: Own calculations based on data the Danish Agrifish Agency and Statistics Denmark

The reduction is observed within all the fleet segments, but is especially significant for the small vessels below 15 metres. It is likely that a significant part of these vessels will stop fishing in the future with the proposed cod quota. If the time perspective of a positive development in the cod stock abundance and quota is years ahead, most of the small vessels do not have the financial robustness to cope with the rather substantial negative financial repercussions in the years until this happens. Thus they will expectedly leave the fishery and sell their fishing rights to other vessels that are not necessarily located in the same area.

Cod is a key species in this fishery, and many of the other species cannot be caught without also catching cod. Thus, many of these vessels are expected to stop fishing, unless they can change their catching behaviour or find alternatives that can generate an income. However, given the quota conditions the options for alternatives seems very limited.

Furthermore, there are the 238 less active-commercial vessels, for which it is not possible to calculate any financial performance indicators. As shown in Table 1, their total landings value will be reduced significantly and by more than 50% in the worst-case scenario. Despite that these vessels does not fish for a commercial purpose, it is likely that such a reduction will make it so unattractive to be a less active-commercial fisherman, and many of them will have to stop fishing.

Table 4 Change in landings value at the county level (1,000 DKK)

Counties	ICES TAC proposal (686 tonnes)		Agreed TAC (2,444 tonnes)	
	Change from baseline to lower cod landings	Change from baseline to reduced landings of cod and other species	Change from baseline to lower cod landings	Change from baseline to reduced landings of cod and other species
Fyn	-21,705	-33,548	-15,827	-24,463
Storstrømmen	-14,270	-19,586	-10,406	-14,282
Bornholm	-11,462	-12,880	-8,358	-9,392
Ringkøbing	-10,061	-10,748	-7,336	-7,837
Frederiksborg	-5,533	-7,547	-4,035	-5,503
Viborg	-5,531	-6,489	-4,033	-4,732
Vestsjælland	-2,857	-4,831	-2,083	-3,523
København	-1,879	-3,150	-1,370	-2,297
Sønderjylland	-1,317	-2,375	-961	-1,732
Roskilde	-859	-1,354	-626	-987
Nordjylland	-447	-603	-326	-439
Aarhus	-423	-747	-308	-545
Vejle	-112	-478	-82	-349

Source: Own calculations based on data the Danish Agrifish Agency and Statistics Denmark

In the small harbours situated in the counties around the western Baltic Sea, there is only minor processing taking place. Some of the landed fish might be sold to local fish mongers and small processing firms. However most of it is sold to larger processing firms located in other areas of Denmark or abroad. So there might be some local consequences for the processing industry, but the size of these is impossible to calculate.

Then there is the onshore service industry in form of ship yards, fuel and ice suppliers etc. The lower activity will have an effect for these industries, because the lower activity gives rise to less use of these services for maintenance and repair. Again, the magnitude is difficult to estimate with the current knowledge. However, it must also be remembered that these industries are not necessarily solely dependent on the activity within the fishery as also leisure boats are visiting these harbours and thereby generate income for the onshore service.

However, one of the reasons for these tourists visiting these harbours is that there are activity and fishing vessels. If the number of fishing vessels are reduced as expected, the harbours might not be as attractive as before, which could thus have a further negative impact on the onshore services and maybe even more important on the other activities that tourists give rise to in the local economy.

2. Possibilities for adapting the fishery

The reduction in the cod quota for the western Baltic Sea will necessarily have negative economic consequences and lead to a reduction in the fleet fishing in this area. The impact is reinforced as the ability and availability of finding ways to alleviate this is very small.

An option to start fishing in other areas and thus other quotas might be a possibility for the larger vessels, but is not considered to be the case for the smaller vessels located in the harbours around the western Baltic Sea. However, what is even more limiting is that these vessels would have to buy quota from the vessels that are currently fishing in the area they would like to switch to. The Danish management system is based on fishing rights covering the most important quotas. Changing fishing activity towards quotas not currently owned, will imply that there is a supply at reasonable prices, which is not considered an option.

Cod is as mentioned often caught in the fishery conducted in the western Baltic Sea and it is almost unavoidable to catch cod. Cod will thus often be a choke species that restricts the utilisation of the other quotas in the western Baltic Sea.

Based on the above, it must be concluded that it will be difficult for these vessels to change their behaviour in a way which can counteract the negative financial repercussions of the reduced cod quota. For some, there might few possibilities, but a large reduction in the number of fishing vessels must be expected quite rapidly during 2017.

Conclusion

Almost the entire quota for cod in area 22-24 is distributed in terms of ITQs, and the vessels holding quota for cod in area 22-24 will bear the entire burden of the reduced cod quota. The burden, however, is reinforced as at least 75% of the vessels are so small that is will be difficult for them to shift to other areas or go further to sea in case it is possible for them to purchase quotas in other areas.

Thus the financial repercussions are considered to be extensive for the fishermen having the majority of their fishing activities in the western Baltic Sea, and unless the stock situation improves considerable very fast, a large number of especially the smaller vessels below 15 meters are expected to leave the fishery during 2017. However, these vessels still carry a substantial amount of fixed costs which will result in a significant capital loss if they have to leave the fishery due to the quota reductions. Although the impacts caused by the cod quota reduction agreed on the 10th October 2016 about the TAC for cod will be less severe than the impacts of the quota reduction proposed by ICES, the significant quota reduction have clear negative economic consequences for Danish fishing vessels, having their main fishing activities in the areas 22-24.